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NOTES ON GEOGRAPHIC DISTRIBUTION

Macchiatiella rhamni tarani (Nevsky, 1928) (Hemiptera, Aphididae, Aphidinae) newly recorded from China

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Abstract. *Macchiatiella rhamni tarani* (Nevsky, 1928) is reported from China for the first time from specimens collected on the undersides of leaves of *Polygonum* L. in north-western China. A new record of *M. rhamni tarani* in China further confirms *Rhamnus* L. as a secondary host. A brief description, key characteristics figures, ecological photographs, and a distribution map are provided.

Key words. Aphid, apterous viviparous female, Central Asia, Macrosiphini, morphology

Sabirov S, Li Z-X, Xu Y, Qiao G-X (2025) *Macchiatiella rhamni tarani* (Nevsky, 1928) (Hemiptera, Aphididae, Aphidinae) newly recorded from China. Check List 21 (3): 552–556. https://doi.org/10.15560/21.3.552

INTRODUCTION

The tribe Macrosiphini is among the most diverse group in aphids, including 255 genera and more than 2300 species (Favret 2025). Aphids of the tribe Macrosiphini are associated with diverse range of host plants including angiosperms and gymnosperms. *Macchiatiella* Del Guercio, 1909 is included in that tribe, which mainly feeds on plants of *Rhamnus* L. (Rhamnaceae) and *Polygonum* L. (Polygonaceae) and only have two species, *Macchiatiella itadori* (Shinji, 1924) and *M. rhamni* (Boyer de Fonscolombe, 1841) (Favret and Aphid Taxon Community 2025).

Macchiatiella rhamni (Boyer de Fonscolombe, 1841) was described in combination with *Aphis* Linnaeus, 1758 and later designated as type species of *Macchiatiella* by del Guercio (1909). It currently includes two subspecies. The nominotypical subspecies *M. rhamni rhamni* is distributed in Europe and has an uncertain life cycle, while populations occurring on *Rhamnus* in the Mediterranean area have been recorded as anholocyclic (Barbagallo and Stroyan 1982); in addition, the records of this species from *Polygonum* in western Europe may not be authentic (Favret and Aphid Taxon Community 2025). The other subspecies, *Macchiatiella rhamni tarani* (Nevsky, 1928) originally named as *Neanuraphis tarani* Nevsky, 1928 and species-type of this genus, was first observed on *Polygonum polymorphum* Ledeb. in summer near Alma-ata, Kazakhstan (Nevsky 1928). Börner (1952) treated the genus *Neanuraphis* as a synonym of *Macchiatiella* and recorded *N. tarani* with host alteration between *Rhamnus cathartica* L. and *P. polymorphum*. Afterwards, *Macchiatiella tarani* (Nevsky, 1928) was treated as a subspecies of *M. rhamni* by Eastop and Hille Ris Lambers (1976). So far, *M. rhamni tarani* was recorded mainly in Central and Western Asia, in countries such as Kazakhstan (Nevsky 1928, 1929), Azerbaijan (Rusanova 1942), Russia (Kadyrbekov 2014a), Armenia (Stepanyan et al. 2023), and Uzbekistan (Abdullaev et al. 2024).

The other species of the genus, *M. itadori*, is already known from Liaoning, China (Zhang and Liu 1986). After checking aphid specimens from north-western China, we found a few samples of *M. rhamni tarani* from Xinjiang Uygur Autonomous Region, China. This new record of *M. rhamni tarani* in China further confirms the secondary host plant of the species.

METHODS

Samples of *Macchiatiella rhamni tarani* were collected from Xinjiang, China and stored in 95% ethanol. Slide-mounted specimens of aphids were made according to the procedure in Xu et al. (2024). The specimens on slides were examined using a Leica DM 2500 light microscope and photographed by a Leica MC

OPEN ACCESS

Academic editor: Mohsen Mehrparvar
Received: 10 March 2025
Accepted: 28 April 2025
Published: 19 May 2025

5400 camera. All samples and specimens were deposited in the National Animal Collection Resource Center (NACRC), Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

RESULTS

Macchiatiella rhamni tarani (Nevsky, 1928)

Figures 1–3

New records. CHINA — Xinjiang • Altay City, Buerjin County; 48.55°N, 087.36°E; 1179 m alt.; 7.VIII.2022; Y. Xu. leg.; on *Polygonum* sp.; 4 ♀ apterous viviparous and 1 apterous nymph, NACRC No. 55665-1-1 • Altay City, Buerjin County; 48.55°N, 087.37°E; 1149 m alt.; 7.VIII.2022; Y. Xu. leg.; on *Polygonum* sp.; 1 ♀ apterous viviparous and 1 alate nymph, NACRC No. 55669-1-1.

Identification. This genus is diagnosed by the following: a very long processus terminalis of antennal segment VI, antennal segment III with secondary rhinaria, siphunculi cylindrical, cauda reduced to a semilunar, abdominal tergites sometimes with spinal sclerites. Species of *Macchiatiella* can be identified using the keys for aphid species feeding on *Rhamnus* and *Polygonum* (Favret and Aphid Taxon Community 2025). Apterous viviparous females of *M. rhamni* are clearly distinguished from *M. itadori* in having the pale siphunculi and the sclerites on abdominal tergites not fused as a large dorsal patch, if they exist at all. *Macchiatiella rhamni tarani* is restricted to Central Asia and alternates its host between *Rhamnus* and *Polygonum*; whereas the nominotypical subspecies, which mainly occurs in Europe and only feeds on *Rhamnus*.

Macchiatiella rhamni tarani was well described by Nevsky (1928) as *Neanuraphis tarani*; its apterous viviparous females are recognised by the pale dorsum of the body, abdominal tergites IV and VI each with one pair of spinal sclerites, tergite V with a transverse spinal sclerite but sometimes this is indistinct (Figure

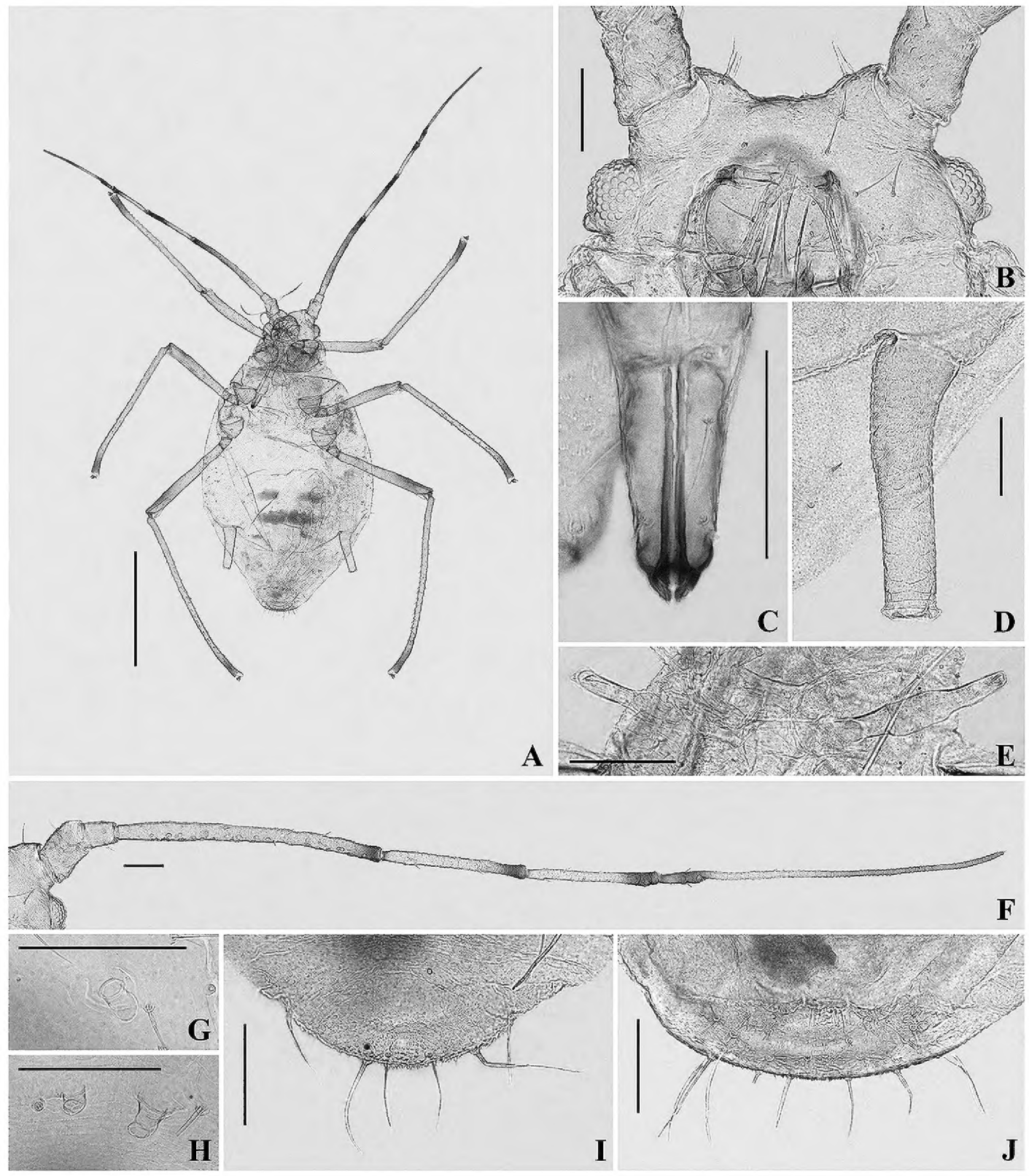

Figure 1. *Macchiatiella rhamni tarani*. Apterous viviparous female. **A.** Dorsal view of body. **B.** Dorsal view of head. **C.** Ultimate rostral segment. **D.** Siphunculus. **E.** Mesosternal furca. **F.** Antenna. **G.** Marginal tubercle on abdominal tergite III. **H.** Spinal tubercles on abdominal tergite VIII. **I.** Cauda. **J.** Anal plate. Scale bars: A = 1.00 mm; B–J = 0.10 mm.

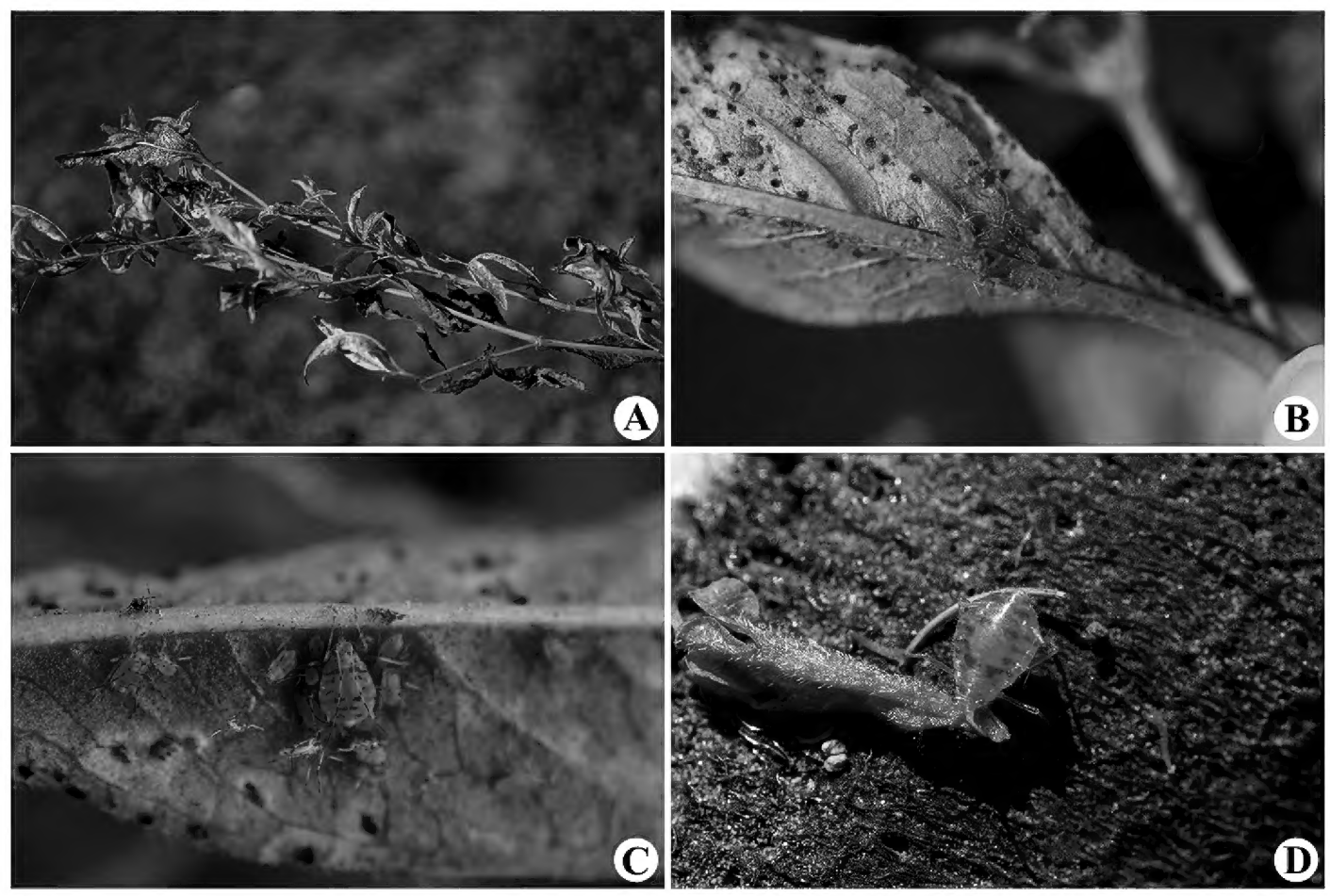

Figure 2. *Macchiatiella rhamni tarani*. **A.** Host plant *Polygonum* sp. **B, C.** Populations on the underside of leaves on host plants. **D.** Apterous viviparous female.

1A), antennal tubercles developed and each with two pairs of setae (Figure 1B), antennal segments III and IV with 26–55 and 3–14 small, rounded secondary rhinaria, respectively (Figure 1F), ultimate rostral segment long and wedge-shaped (Figure 1C), mesosternal furca sessile (Figure 1E), abdominal tergites II and III each with one pair of small marginal tubercles (Figure 1G) and tergite VIII with one pair of spinal tubercles (Figure 1H), siphunculi cylindrical with spinulose imbrications and slightly broader at the base (Figure 1D), cauda semilunar (Figure 1I), and anal plate broadly round (Figure 1J).

Host plant. Populations of aphids were found feeding on *Polygonum* sp. (*Polygonaceae*) in the study (Figure 2A).

Biology. This aphid subspecies was found colonising the undersides of leaves of its host in the study (Figure 2B–C).

Distribution. China (Xinjiang), Armenia (Stepanyan et al. 2023), Azerbaijan (Rusanova 1942), Kazakhstan (Nevsky 1928, 1929), Uzbekistan (Abdullaev et al. 2024), and Russia (Altai territory) (Kadyrbekov 2014a).

DISCUSSION

The distribution of *Macchiatiella rhamni tarani* in north-western China is shown in Figure 3. Samples of these newly recorded aphids were collected in Altay, Xinjiang, located in the southern Altai Mountains near eastern Kazakhstan. *Macchiatiella rhamni tarani* has been frequently reported from the mountains of Kazakhstan where it is mesophilic montane subspecies in the mountain ranges of south-western Altai, Sauro-Tarbagatai, Dzungarian Alatau, and northern and western Tien Shan (Kadyrbekov 2006, 2009, 2013, 2014b); it also has been found in Altai territory in Russia (Kadyrbekov 2014a). Because the samples of *M. rhamni tarani* from China were collected near the known geographic distribution of this subspecies, it is reasonable to suppose that suitable habitat extends across this mountainous region.

Some *Macchiatiella* specimens identified as *M. rhamni* from Mongolia and Korea and feeding on *Polygonum* show some morphological characteristics inconsistent with European specimens; these are possibly not the same taxon (Favret and Aphid Taxon Community 2025). Our findings demonstrate the distribution of *M. rhamni tarani* and indicate its potential dispersal, exhibit the morphological and biological characters, which provides more evidence for further confirmation of questionable specimens. Therefore, even though there are insufficient number of samples of *M. rhamni tarani* from north-western China, some valuable taxonomic and geographical distribution information have been revealed.

ACKNOWLEDGEMENTS

We are grateful to Ms. Fendi Yang for slides preparation. We sincerely thank the anonymous reviewers and all editors for their comments and suggestions, which have greatly improved the manuscript.

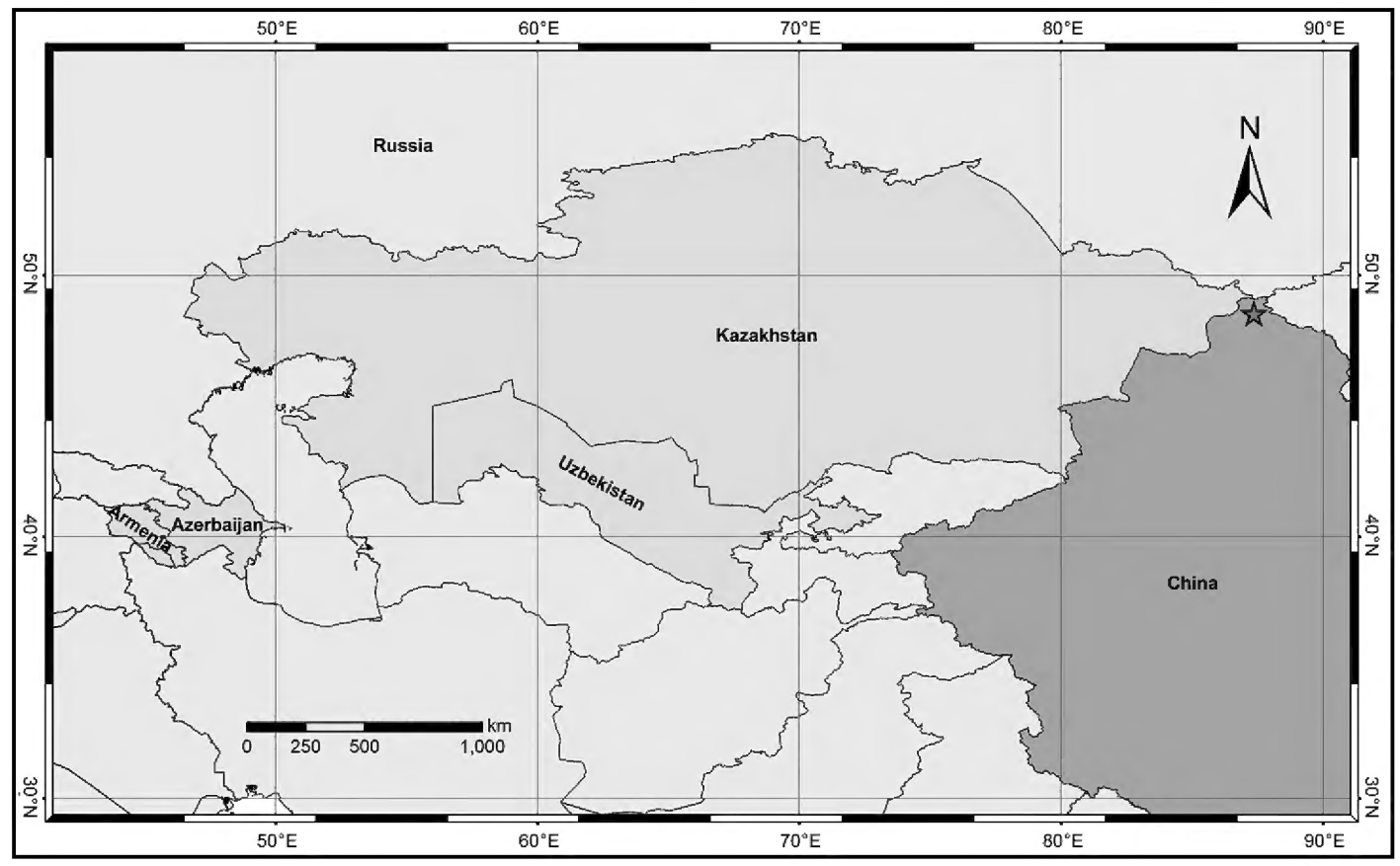

Figure 3. Distribution of *Macchiatiella rhamni tarani*. Countries in yellow indicate previous known distribution. The new records are marked with a green star.

ADDITIONAL INFORMATION

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

Funding

This study was financially supported by the National Natural Science Foundation of China (grant nos. 32470472, 32261143728), the Third Xinjiang Scientific Expedition Program (grant no. 2021xjkk0600), and the Initiative Scientific Research Program of the Institute of Zoology, Chinese Academy of Sciences (grant no. 2023IOZ0104).

Author contributions

Conceptualization: SS, GXQ. Investigation: GXQ, YX, ZXL. Methodology: SS, YX, ZXL. Formal analysis: SS, ZXL, YX. Visualization: ZXL, YX. Supervision: GXQ. Writing – original draft: SS, ZXL. Writing – review and editing: GXQ.

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Data availability

All data that support the findings of this study are available in the main text.

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